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THE MINERAL INDUSTRY OF PENNSYLVANIA IN 1985

L. J. Prosser

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Information Circular 96
1987

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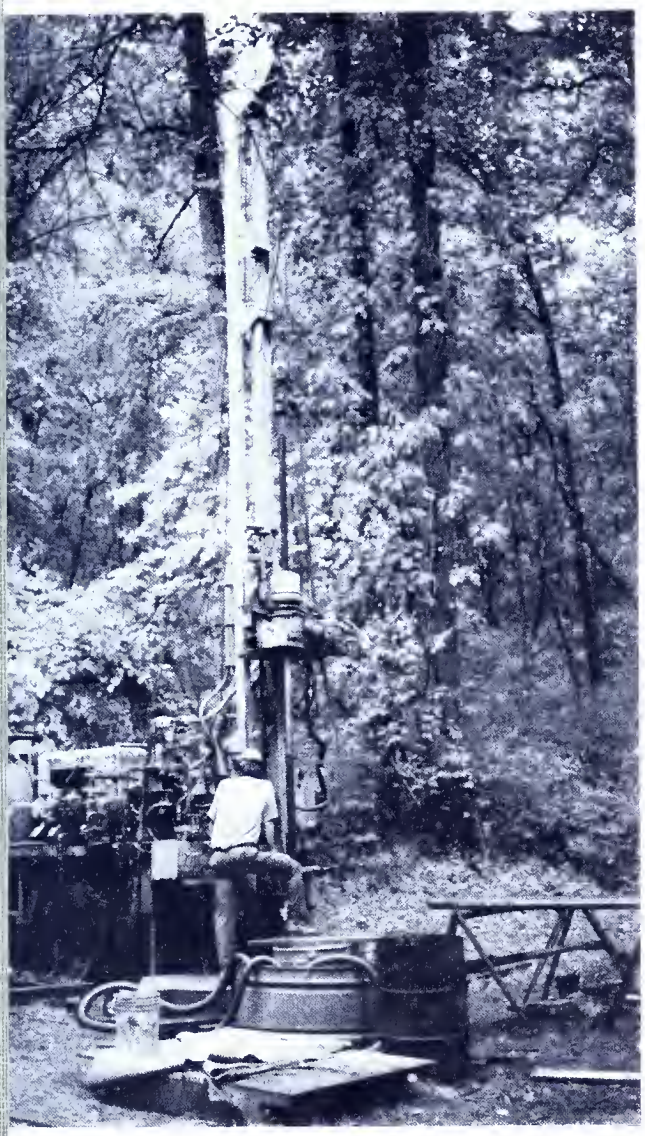

L. J. Prosser, Jr.
Robert C. Smith, II

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
OFFICE OF RESOURCES MANAGEMENT
BUREAU OF
TOPOGRAPHIC AND GEOLOGIC SURVEY
Donald M. Hoskins, State Geologist

ON THE COVER: Cooperative core-hole drilling by the U.S. Geological Survey and Pennsylvania Geological Survey in Jurassic York Haven-type diabase. Drilling such as this in southeastern Pennsylvania helps to identify new targets for mineral exploration.

PY 6345/4.10/7 no. 96
Prossar, L. J.
The mineral industry of
Pennsylvania in 1985

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UNITED STATES DEPARTMENT OF THE INTERIOR • Donald Paul Hodel, Secretary

BUREAU OF MINES • Robert C. Horton, Director

This publicotion is o chopter from the current Bureou of Mines Minerols Yearbook, comprising *Volume I, Metals and Minerals; Volume II, Area Reports: Domestic; Volume III, Area Reports: International.* The seporote volumes of the Yeorbook ore sold by the Superintendent of Documents, Woshington, D.C. 20402.

The Mineral Industry of Pennsylvania

This chapter has been prepared under a Memorandum of Understanding between the Bureau of Mines, U.S. Department of the Interior, and the Pennsylvania Bureau of Topographic and Geologic Survey, Department of Environmental Resources, for collecting information on all nonfuel minerals.

By L. J. Prosser, Jr.,[1] and Robert C. Smith[2]

The value of Pennsylvania's nonfuel mineral production of about $804 million was the highest in the State's history. Nationally, Pennsylvania ranked eighth in value of nonfuel mineral production accounting for about 3.5% of the U.S. total. The increase in value of $96 million over that of 1984 was also the largest among the 50 States in 1985. However, the record-high value reflected, primarily, continuing higher prices for mineral commodities produced in Pennsylvania rather than significant gains in mineral output.

Table 1.—Nonfuel mineral production in Pennsylvania[1]

Mineral	1984		1985	
	Quantity	Value (thousands)	Quantity	Value (thousands)
Cement:				
Masonry thousand short tons	298	$20,849	303	$20,970
Portland do	5,735	281,590	5,535	288,036
Clays[2] do	963	4,050	1,142	5,293
Gem stones	NA	5	NA	5
Lime thousand short tons	1,620	90,182	1,492	85,269
Peat do	24	693	21	602
Sand and gravel:				
Construction do	14,472	64,285	e17,000	e74,000
Industrial do	W	W	693	9,846
Stone:				
Crushed do	e56,200	e228,000	64,765	310,859
Dimension do	e44	e6,001	51	8,214
Combined value of clays (kaolin), mica (scrap), and value indicated by symbol W	XX	12,701	XX	1,380
Total	XX	708,356	XX	804,474

eEstimated. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "Combined value" figure. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Excludes kaolin; value included with "Combined value" figure.

Table 2.—Nonfuel minerals produced in Pennsylvania in 1984, by county[1]

County	Minerals produced in order of value
Adams	Lime, clays, mica.
Allegheny	Cement, sand and gravel, clays.
Armstrong	Sand and gravel, clays.
Beaver	Do.
Berks	Cement, clays.
Blair	Sand and gravel.
Bradford	Do.
Bucks	Sand and gravel, clays.
Butler	Lime, cement, sand and gravel.
Cameron	Sand and gravel.
Carbon	Do.
Centre	Lime.
Chester	Lime, clays.
Clinton	Clays.
Columbia	Sand and gravel.
Crawford	Do.
Cumberland	Do.
Dauphin	Do.
Erie	Sand and gravel, peat.
Forest	Sand and gravel.
Franklin	Do.
Fulton	Do.
Huntingdon	Do.
Jefferson	Clays, sand and gravel.
Lackawanna	Peat, sand and gravel.
Lancaster	Clays.
Lawrence	Cement, sand and gravel, clays, peat.
Lebanon	Lime.
Lehigh	Cement.
Luzerne	Sand and gravel, peat.
Lycoming	Sand and gravel.
Mercer	Do.
Mifflin	Lime, sand and gravel.
Monroe	Sand and gravel, clays, peat.
Montgomery	Lime.
Northampton	Cement, sand and gravel.
Northumberland	Sand and gravel, clays.
Pike	Sand and gravel.
Schuylkill	Do.
Susquehanna	Do.
Tioga	Do.
Union	Clays.
Venango	Sand and gravel.
Warren	Do.
Wayne	Do.
Westmoreland	Do.
Wyoming	Do.
York	Lime, cement, sand and gravel, clays.
Undistributed[2]	Stone (crushed and dimension), gem stones.

[1]No production of nonfuel mineral commodities was reported for counties not listed.
[2]Data not available by county for minerals listed.

Trends and Developments.—Increased prices for mineral commodities coupled with demand for industrial minerals by the construction industry escalated Pennsylvania's value of nonfuel mineral production to a record high of $804 million. Cement, lime, construction sand and gravel, and crushed stone accounted for about $780 million or 97% of the total value.

The previous State record for the value of nonfuel mineral production was $722 million in 1979. Since 1979, the unit prices of Pennsylvania's four leading commodities in total value had increased or remained above that of the national average. The average price per short ton of crushed stone (f.o.b. quarry) in the United States in 1979 was $2.98; in Pennsylvania, $3.14 or 5% above the national average. By 1985, crushed stone prices in Pennsylvania were $4.80 per ton, which was $0.75 or nearly 20% above the U.S. average. An even greater change occurred in cement prices over the last 6 years. In 1979, portland cement sold in Pennsylvania for about $40 per short ton (mill value) compared with $46 per ton nationally. Gradually, since 1979, Pennsylvania cement prices rose to $52.04 surpassing the national average by $0.63 in 1985. Whereas the average U.S. price for cement increased 12% since 1979, Pennsylvania's price was 30% higher. Lime prices in Pennsylvania ranged from 6% to 11% above the national average for the past 6 years. Of the 17 States producing more than 200,000 short tons of lime in 1985, Pennsylvania's average price of $57.15 per short ton was third highest. In 1979, the unit value per short ton of construction sand and gravel in Pennsylvania was $3.15, second highest among the 50 States and 40% above the national average. In 1985, a ton of construction sand and gravel in Pennsylvania cost $4.35, highest in the Nation and 43% above the U.S. average.

The recent history of mineral prices in Pennsylvania is related to changes in the domestic and international marketplace along with the indigenous conditions in the State's mining industry. The State's cement industry used the wet process at 5 of its 11 plants. Nationally, about 38% of production was exclusively from wet-process plants. Average fuel consumption for kiln-firing in wet-process plants was 33% higher than for dry-process operations. Also in 1985, cement imports increased to nearly 14.5 million tons, the highest level in U.S. history. Traditionally, Pennsylvania's steel industry consumed more than 50% of the State's lime production. That percentage of consumption remained about the same in 1985. The State's steel production has declined by about 25% since the late 1970's. The decline in Pennsylvania's steel, cement, and lime manufacturing also reduced the output of crushed stone, particularly limestone. As the population continued to move from cities to suburbs, the land available for mining aggregate declined because of local zoning and other regulations. In addition, environmental concerns and stipulations increased the time and cost for aggregate producers in opening or expanding mining operations. These conditions were similar nationwide, but particularly affected Pennsylvania sand and gravel production because of inherent limited resources.

Table 3.—Indicators of Pennsylvania business activity

		1983[r]	1984	1985[p]
Employment and labor force, annual average:				
Population	thousands	11,891	11,887	11,853
Total civilian labor force	do.	5,506	5,479	5,519
Unemployment	percent	11.8	9.1	8.0
Employment (nonagricultural):				
Mining total[1]	thousands	39.0	38.6	36.3
Nonmetallic minerals except fuels	do.	3.9	4.0	4.6
Coal mining	do.	30.1	29.1	26.0
Oil and gas extraction[2]	do.	4.9	5.4	5.6
Manufacturing total	do.	1,095.8	1,121.9	1,089.5
Primary metal industries	do.	120.4	117.9	104.5
Stone, clay, and glass products	do.	48.7	49.0	47.9
Chemicals and allied products	do.	58.1	59.2	59.8
Petroleum and coal products	do.	14.8	13.0	12.6
Construction	do.	165.7	175.8	189.5
Transportation and public utilities	do.	239.7	244.2	239.4
Wholesale and retail trade	do.	994.1	1,033.1	1,069.0
Finance, insurance, real estate	do.	243.0	253.5	262.4
Services	do.	1,073.2	1,114.9	1,170.8
Government and government enterprises	do.	673.7	672.9	679.3
Total[3]	do.	4,524.3	4,654.8	4,736.3
Personal income:				
Total	millions	$141,508	$151,020	$159,276
Per capita		$11,901	$12,704	$13,437
Hours and earnings:				
Total average weekly hours, production workers		39.2	40.2	39.9
Mining (nonmetallic minerals, except fuels)		43.4	44.6	45.0
Total average hourly earnings, production workers		$8.9	$9.3	$9.6
Mining (nonmetallic minerals, except fuels)		$9.0	$9.3	$9.7
Earnings by industry:				
Farm income	millions	$496	$978	$850
Nonfarm	do.	$97,190	$104,751	$110,885
Mining total	do.	$1,571	$1,792	$1,710
Metal mining	do.	$6	W	W
Nonmetallic minerals except fuels	do.	$97	$102	$127
Manufacturing total	do.	$27,181	$29,086	$29,625
Primary metal industries	do.	$4,037	$4,116	$3,787
Stone, clay, and glass products	do.	$1,280	$1,342	$1,382
Chemicals and allied products	do.	$1,885	$1,991	$2,157
Petroleum and coal products	do.	$732	$692	$705
Construction	do.	$5,556	$6,080	$6,442
Transportation and public utilities	do.	$7,251	$7,749	$7,973
Wholesale and retail trade	do.	$15,312	$16,296	$17,258
Finance, insurance, real estate	do.	$5,269	$5,653	$6,543
Services	do.	$21,456	$23,790	$26,165
Government and government enterprises	do.	$13,234	$13,951	$14,792
Construction activity:				
Number of private and public residential units authorized[4]		33,508	39,546	43,566
Value of nonresidential construction[4]	millions	$1,744.3	$2,013.0	$2,115.4
Value of State road contract awards	do.	$298.0	$941.0	$1,252.0
Shipments of portland and masonry cement to and within the State	thousand short tons	2,417	2,686	3,025
Nonfuel mineral production value:				
Total crude mineral value	millions	$635.1	$708.4	$804.5
Value per capita		$53	$60	$68

[p]Preliminary. [r]Revised. W Withheld to avoid disclosing company proprietary data.
[1]Bureau of Labor Statistics, U.S. Department of Labor; totals may not add because of inclusion of data from other sources.
[2]Bureau of Economic Analysis, Regional Economic Measurement Division, U.S. Department of Commerce.
[3]Data may not add to totals shown because of independent rounding.
[4]1983 data based upon 16,000-place sample; 1984 and 1985 data based upon 17,000-place sample.

Sources: U.S. Department of Commerce, U.S. Department of Labor, Highway and Heavy Construction Magazine, and U.S. Bureau of Mines.

Legislation and Government Programs.—Unresolved for the second year was a proposal by the U.S. Department of Transportation to sell the federally owned Consolidated Railroad Corp. (Conrail) to private interests. About 15,000 Pennsylvanians are employed by Conrail, nearly 40% of the company's work force. Also, about 28% (4,014 miles) of the railroad system is in the State. The State's steel, coal, and other mineral producers heavily dependent on rail transportation were concerned that the sale could result in abandonment of some routes and reduce competition in the East affecting freight rates.

The Pennsylvania Bureau of Topographic and Geologic Survey's mineral resource program published a directory of nonfuel mineral producers that included the geologic formation and rock type of each operation.[3] Also completed during the year was a geologic map illustrating the 19 basic rock types in the State.[4] This map simplified the 1980 Geologic Map of Pennsylvania (Map 1), which detailed geologic age relationships.

Future studies anticipated by the Penn-

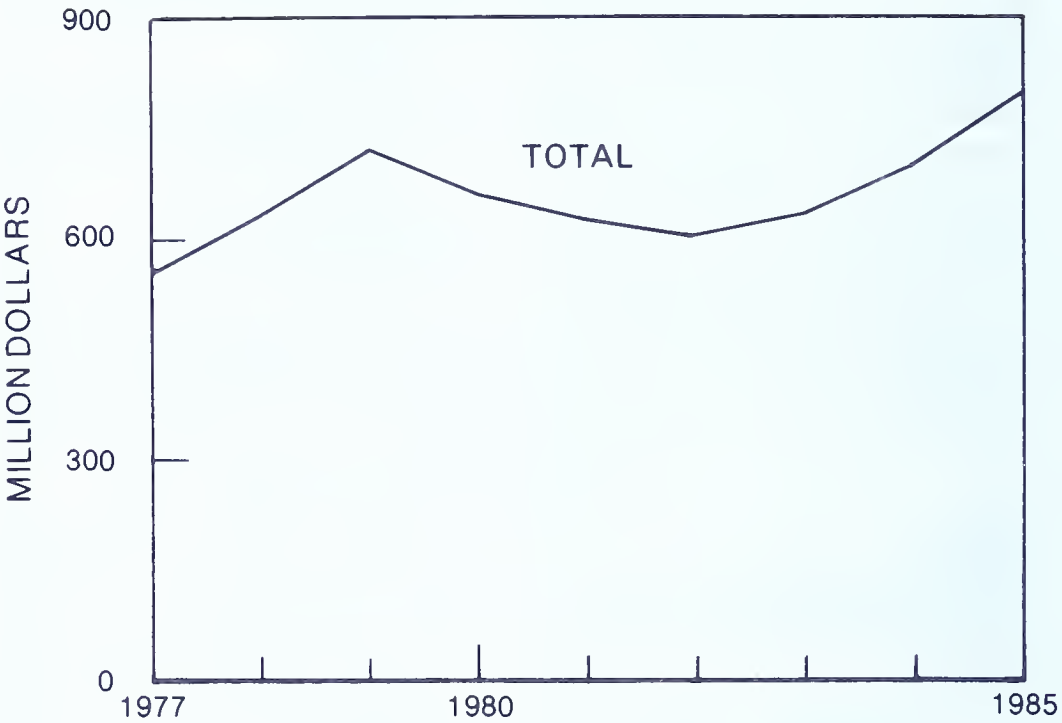


Figure 1.—Total value of nonfuel mineral production in Pennsylvania.

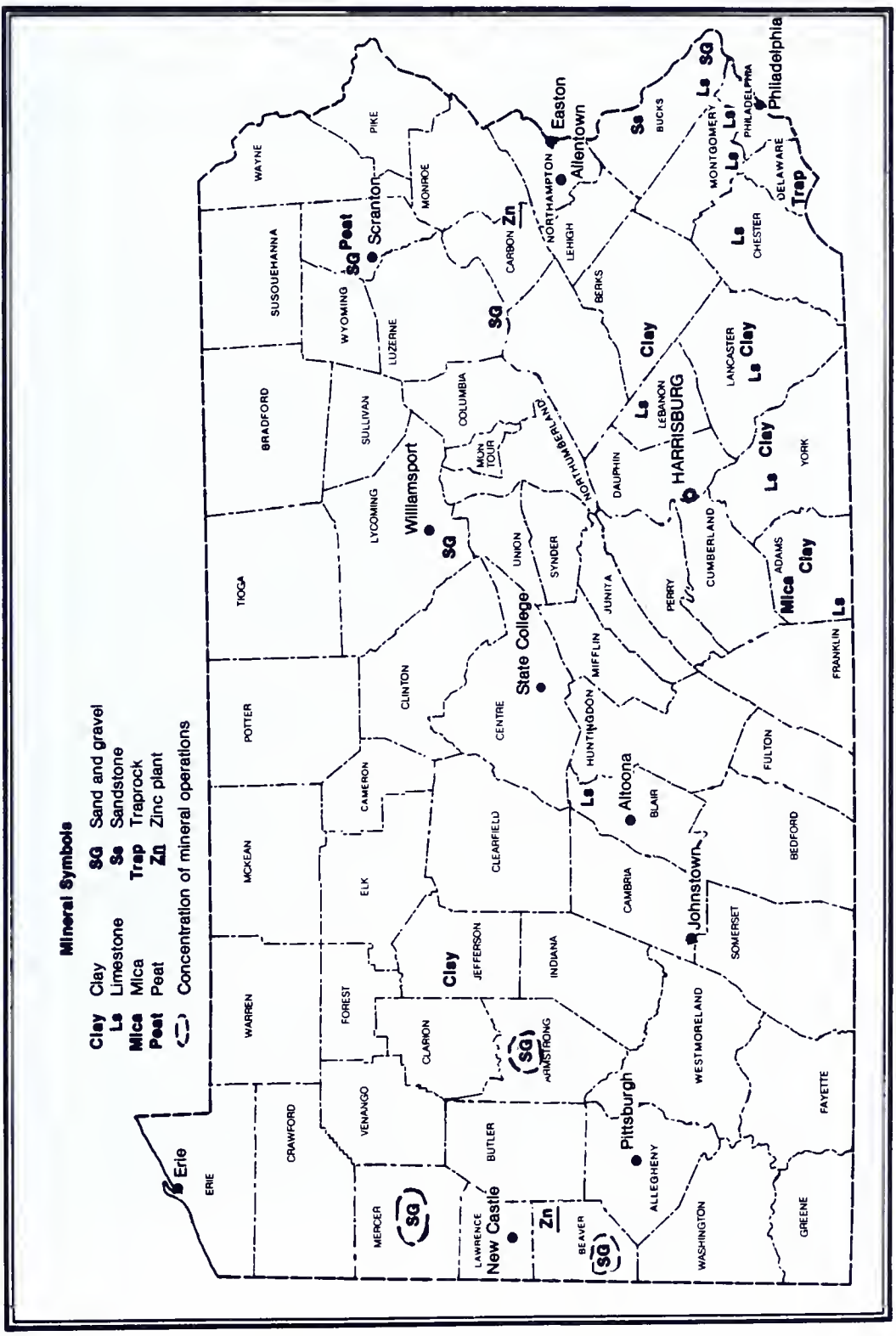
sylvania Geological Survey (PGS) included a followup investigation of high-purity silica in the Blue Ridge physiographic province, description and characterization of the uranium mineralization in the Reading Prong, and chemical analyses of thick Ordovician Age carbonates in central Pennsylvania. A compilation of early Mesozoic copper-gold occurrences was planned in support of the U.S. Geological Survey's studies of mineralization associated with early Mesozoic diabase.

The cooperative clay-shale testing program between the U.S. Bureau of Mines and PGS has tested more than 900 sources for the purpose of identifying new ceramic resources in the State. Although this program was to end in 1986, information and sample briquets were available for inspection at the PGS headquarters in Harrisburg.

Federal programs included research at the U.S. Bureau of Mines Pittsburgh Research Center. Among the projects at the center in 1985 was one to develop an artificial intelligence system with the capability to recommend solutions when hazardous conditions occur in a mine. Subsidence profiles for northern Appalachia were designed using a computer model along with actual observation. This work was expected to be expanded for use in other regions of the country.[5]

In October, the State received a $41.5 million grant for its reclamation and coal mine regulatory program from the Office of Surface Mining (OSM), U.S. Department of the Interior. The funding will be used to reclaim 84 sites, including the Cherry Land limestone mines in Armstrong County and the Oakhurst clay mine in Cambria County. The mine reclamation funds came from fees paid by coal mine operators nationwide and were administered by OSM for reclamation of mines abandoned before 1977.

The State needed an additional $97 million to reclaim strip mines covering 15,000 acres abandoned since 1977, according to Pennsylvania's Department of Environmental Resources (DER). Although State and Federal laws require strip mine operators to reclaim the land, poor coal markets, enforcement problems, and operators failing to reclaim land in the last 8 years resulted in the acres of unreclaimed land. In 1985, the DER reclaimed 460 acres, a tenfold increase since 1980.


Mineral Symbols
Clay Clay
La Limestone
Mica Mica
Peat Peat
SG Sand and gravel
Ss Sandstone
Trap Traprock
Zn Zinc plant
Concentration of mineral operations
Erie
Pittsburgh
Johnstown
Altoona
State College
Williamsport
Scranton
Easton
Allentown
Philadelphia
New Castle
HARRISBURG
ERIE
CRAWFORD
WARREN
MERCER
VENANGO
FOREST
CLARION
BUTLER
LAWRENCE
BEAVER
ALLEGHENY
WASHINGTON
GREENE
FAYETTE
WESTMORELAND
SOMERSET
BEDFORD
FULTON
ARMSTRONG
INDIANA
CAMBRIA
BLAIR
HUNTINGDON
MIFFLIN
JUNIATA
PERRY
CUMBERLAND
ADAMS
FRANKLIN
YORK
LANCASTER
LEBANON
DAUPHIN
LEHIGH
NORTHAMPTON
BERKS
CHESTER
DELAWARE
MONTGOMERY
PHILADELPHIA
BUCKS
PIKE
WAYNE
MONROE
WYOMING
LUZERNE
SUSQUEHANNA
BRADFORD
SULLIVAN
LYCOMING
TIOGA
POTTER
MCKEAN
CAMERON
ELK
CLEARFIELD
CLINTON
CENTRE
UNION
SNYDER
NORTHUMBERLAND
MUN TOUR
COLUMBIA
CARBON
MCKEAN
JEFFERSON
CLARION
ARMSTRONG
INDIANA
BUTLER
LAWRENCE
MERCER
VENANGO
FOREST
ELK
CAMERON
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FRANKLIN
FULTON
BEDFORD
SOMERSET
WESTMORELAND
FAYETTE
GREENE
WASHINGTON
ALLEGHENY
BEAVER
LAWRENCE
BUTLER
CARBON
LEHIGH
NORTHAMPTON
BERKS
CHESTER
DELAWARE
MONTGOMERY
PHILADELPHIA
BUCKS
Clay
Clay
Clay

REVIEW BY NONFUEL MINERAL COMMODITIES

INDUSTRIAL MINERALS

In this section, nonfuel mineral commodities that were mined in Pennsylvania in 1985 are discussed. Quantity and value data for these commodities are given in table 1.

Pennsylvania also manufactured or processed graphite, gypsum, perlite, pyrophyllite, slag, sulfur, sulfuric acid, and vermiculite. Combined value of these processed minerals was about $95 million.

Cement.—In Pennsylvania, cement data are divided into two districts: eastern Pennsylvania, which is all counties east of the eastern boundaries of Potter, Clinton, Centre, Huntingdon, and Franklin Counties; and western Pennsylvania, which is all other counties in the State. In 1985, the State's nine eastern plants produced 4.3 million short tons of portland cement utilizing about 85% of capacity. Pennsylvania's four western plants produced about 1.3 million tons of portland cement utilizing about 52% of capacity.

Construction of two new cement import terminals was expected to increase competition for cement producers in eastern Pennsylvania. Late in 1985, Norwegian and Italian interests purchased a site in Philadelphia and began constructing a dry bulk-loading facility. The facility was expected to be equipped by mid-1986 for the import of cement and export of coal. A second terminal was under construction in Chester. The two terminals were expected to have a combined capacity of 500,000 tons or about 10% of the total capacity of cement plants in eastern Pennsylvania.

Also during the year, Allentown Cement Co. Inc., an independent producer, purchased the Evansville cement plant and quarry of National Gypsum Co. The sale also included cement terminals in Bowie, MD, and Jersey City, NJ.

Fuller International Inc., Bethlehem, signed a $26 million contract with Fecto Cement Ltd. According to the agreement, a 2,000-ton-per-day cement plant is scheduled for completion in 1987 at a site about 10 miles north of Islamabad, Pakistan.

Clays.—Output of clay and shale increased for the second consecutive year. The nearly 20% gain in output primarily resulted from demand for brick from the construction industry.

Table 4.—Pennsylvania: Clays sold or used by producers, by use[1]

(Short tons)

Use	1984	1985
Common brick	4,000	10,000
Face brick	761,237	772,491
Firebrick, blocks and shapes	15,524	139,204
Flue linings	24,220	44,348
Mortar and cement, refractory	38,812	38,926
Portland and other cements	85,107	93,080
Tile: Drain, quarry, structural	31,120	31,295
Other[2]	2,935	12,873
Total	962,955	1,142,217

[1]Excludes kaolin.
[2]Includes paint, lightweight aggregates, highway surfacing, and structural concrete.

Gem Stones.—Rockhounds and mineral dealers collected mineral specimens and semiprecious gem stones in Pennsylvania valued at an estimated $5,000.

Lime.—Pennsylvania was one of six States that produced more than 1 million short tons of lime. The State ranked fourth nationally in total output despite a 128,000-ton or 8% decline in production in 1985 compared with that of 1984. The lower output in 1985 reflected decreases in coal and steel production. One small tonnage producer, Honey Creek Lime Co., Reedsville, Mifflin County, was shut down for the year.

Table 5.—Pennsylvania: Lime sold and used by producers, by use

Use	1984		1985	
	Quantity (short tons)	Value (thousands)	Quantity (short tons)	Value (thousands)
Steel, basic oxygen furnace	545,086	$27,674	545,453	$29,454
Steel, electric	222,673	10,960	194,462	10,495
Sewage treatment	180,399	9,827	143,342	8,807
Acid water neutralization (mine and plant)	97,379	5,827	46,428	2,464
Water purification	89,830	5,169	72,543	4,323
Paper and pulp	30,259	1,482	30,844	1,543
Agriculture	20,245	1,381	W	W
Other[1]	433,832	27,862	458,907	28,183
Total	1,619,703	90,182	1,491,979	85,269

W Withheld to avoid disclosing company proprietary data; included with "Other."
[1]Includes alkalies, animal and human food, briquetting (1984), desiccant (1984), explosives (1984), fiberglass (1984), glass, oil well drilling, other ore concentration, manganese, mason's lime, other chemical and industrial uses, other metallurgy, paint, petroleum refining, refractories, sand lime brick, soil stabilization, sugar refining, sulfur removal from stack gases, steel (open-hearth), tanning, wire drawing, and data indicated by symbol W.

Mica.—Gross Mineral Corp. mined mica (sericite) near Fairfield, Adams County. The mica was trucked to a plant in Aspers for processing and used as a filler and extender primarily by the automotive industry.

Peat.—In a ruling by the State's Attorney General in 1984, peat was considered "not a mineral." With that ruling, regulation of peat mining became the responsibility of the Bureau of Dams and Waterway Management (BDWM) because peat bogs are typically associated with wetland areas. This change in authority increased procedures and regulations regarding permitting, mining, and reclamation of peat bogs. In 1985, the BDWM continued to work with peat producers to lessen the impact of the change in regulations.

Sand and Gravel.—*Construction.*—Construction sand and gravel production is surveyed by the U.S. Bureau of Mines for even-numbered years only; therefore, this chapter contains only estimates for 1985. Data for odd-numbered years are based on annual company estimates made before yearend.

Construction sand and gravel production increased for the second consecutive year. Both the housing and highway construction industries reported gains in 1985 as measured in the number of housing units started and the value of State road contracts. Construction sand and gravel prices in Pennsylvania also remained high at $4.35 per short ton, $1.30 above the U.S. average price and the highest in the Nation.

During the year, Pittsburgh Sand & Gravel Co. began operating a 350-ton-per-hour dredge and processing plant near the Pike Island Dam along the Ohio River. The new dredge was equipped with a unique diffuser that minimized turbidity and distributed waste water particulates over the river bottom.[6] Pittsburgh Sand & Gravel's market area included eastern Ohio, western Pennsylvania, and the West Virginia Panhandle.

Industrial.—Pennsylvania's leading industrial sand producer, Pennsylvania Glass Sand Corp., was sold to United States Borax & Chemical Corp., a subsidiary of The Rio Tinto Zinc Corp. PLC of the United Kingdom. The firm mined industrial sand in Huntingdon County primarily for use in manufacture of glass containers.

Stone.—Stone production is surveyed by the U.S. Bureau of Mines for odd-numbered years only; the 1984 chapter gave estimates. Data for even-numbered years are based on annual company estimates made before yearend.

Crushed.—Crushed stone output increased 15% in 1985 and was the highest total reported in 6 years. About 70% of the stone produced was limestone. Also mined were dolomite, granite, sandstone, and traprock.

Table 6.—Pennsylvania: Crushed stone[1] sold or used by producers in 1985, by use

(Thousand short tons and thousand dollars)

Use	Quantity	Value
Coarse aggregate (+1-1/2 inch):		
Macadam	953	3,731
Riprap and jetty stone	537	2,156
Filter stone	145	680
Coarse aggregate, graded:		
Concrete aggregate, coarse	4,346	17,748
Bituminous aggregate, coarse	4,553	19,199
Bituminous surface-treatment aggregate	2,377	11,329
Other graded coarse aggregate	376	1,568
Fine aggregate (-3/8 inch):		
Stone sand, concrete	824	4,197
Stone sand, bituminous mix or seal	1,329	5,353
Screening, undesignated	621	2,264
Combined coarse and fine aggregates:		
Graded road base or subbase	12,573	51,484
Unpaved road surfacing	1,779	8,770
Terrazzo and exposed aggregate	1,873	7,805
Other construction[2]	2,945	11,347
Agricultural: Agricultural limestone	1,219	10,480
Chemical and metallurgical:		
Cement manufacture	6,571	25,420
Lime manufacture	1,533	8,422
Flux stone	1,810	11,137
Special:		
Other fillers or extenders	377	6,435
Other miscellaneous[3]	4,419	35,586
Other unspecified[4]	13,602	65,749
Total[5]	64,765	310,859

[1]Includes dolomite, granite, limestone, sandstone, slate, traprock, and miscellaneous stone.
[2]Includes stone used in terrazzo and exposed aggregate, combined coarse and fine aggregates, building products, and stone used for other construction and maintenance purposes.
[3]Includes stone used in dead-burned dolomite manufacture, mine dusting or acid water treatment, poultry grit and mineral food, whiting or whiting substitute, glass manufacture, paper manufacture, porcelain, roofing granules, and other uses not listed.
[4]Includes production reported without a breakdown by end use and estimates for nonrespondents.
[5]Data may not add to totals shown because of independent rounding.

Dimension.—In 1985, 51,000 short tons (617,820 cubic feet) of dimension stone was produced in Pennsylvania. Types of stone quarried in descending order of production were sandstone, slate, and block granite (diabase). Demand remained strong for the State's slate and flagstone products. During the year, a summary of Pennsylvania's slate industry was published.[7]

Table 7.—Pennsylvania: Dimension stone[1] sold or used by producers in 1985, by use

	Quantity (short tons)	Cubic feet (thousands)	Value (thousands)
Rough stone:			
Irregular-shaped stone	16,488	211	$667
Dressed stone:			
Monumental	8,220	98	1,678
Structural and sanitary	4,434	49	2,129
Flagging	6,151	69	549
Flooring slate	1,526	17	419
Roofing slate	4,135	45	2,138
Billiard table tops	1,379	16	174
Other[2]	8,935	112	460
Total	51,268	[3]618	8,214

[1]Includes granite, sandstone, slate, and miscellaneous stone.
[2]Includes ashlars and partially squared pieces and a small amount of rough blocks for building and construction.
[3]Data do not add to total shown because of independent rounding.

METALS

Metals discussed in this section were processed from materials received from both foreign and domestic sources. Pennsylvania's last metal mine was closed in 1983. Production and value data for these metals, which are not included in table 1, are given if available.

Beryllium.—The Cabot Wrought Products Div. of Cabot Corp. produced beryllium-copper and other beryllium alloys at its Reading, PA, plant. In October 1985, Cabot announced that it would sell most of its alloys and metals facilities, including its beryllium-copper alloy sector, as part of a restructuring program. The divestiture reportedly would include beryllium-copper alloy facilities at Reading.[8]

Iron and Steel.—Pennsylvania ranked third of 10 States in pig iron shipments in 1985. Shipments declined by about 1.1 million short tons to a total of 6.5 million tons compared with the 1984 total. Correspondingly, the value of shipments declined from $1.6 billion in 1984 to $1.4 billion in 1985.

Steel production also decreased in Pennsylvania in 1985 to about 12 million tons from 14.4 million tons in 1984. Pennsylvania accounted for about 13% of U.S. steel production in 1985.

The decline in the State's iron and steel industry was reflected in plant closings during the year. Wheeling-Pittsburgh Steel Corp. (W-P), with about $500 million in long-term debts, filed for chapter 11 bankruptcy protection in April. In July, union workers began a 98-day strike that was finally settled with a new contract that reduced employment costs by about 16%. W-P, the Nation's seventh largest steel producer, employed about 8,200 workers at plants in Pennsylvania, Ohio, and West Virginia.

In Pennsylvania, W-P permanently closed its hot-strip mill and seamless tube operations in Allenport. Remaining in operation were a tandem mill, pickle line, temper mill, and annealing facility employing about 425 of an early 1980's work force of 2,000. At W-P's other Pennsylvania operation in Monessen, the last operating blast furnace was shut down at yearend to reduce inventory. W-P also announced that a feasibility study on replacing the blast furnace with an electric arc furnace (EAF) would be completed by mid-1986. LTV Steel Co. shut down or idled facilities at Alliquippa, Beaver Falls, and Pittsburgh, reducing employment from about 22,000 in 1979 to about 2,400 at yearend 1985. Armco Inc. also closed a tubular goods plant at Ambridge. That closing resulted in an employment loss of about 1,500. The continuing decline in Pennsylvania's steel industry from a 30-million-ton-per-year scale in 1970 to 12 million in 1985 paralleled the demise of integrated steel producers in the Northeast.

In addition to foreign competition, integrated producers faced domestic competition from minimills. Minimills usually have less than 1 million tons of annual capacity and employ mostly nonunion workers. Employee wages and benefits at minimills were about $16 per hour versus $22 to $23 for unionized workers.[9]

Minimills also typically use EAF that remelt steel scrap. In contrast, integrated plants in the Northeast, predominantly equipped with basic oxygen and open-hearth furnaces, required higher quantities of the raw materials used in steelmaking.

The local economic impact of plant closings and cutbacks was exemplified by Bethlehem Steel's request for a reduction in property taxes for its Northampton County operations. Bethlehem Steel requested the assessed value of its properties be dropped from $32 million to $18 million thereby lowering its tax obligation from $3.5 million to $1.9 million. In 1985, the $3.5 million paid by Bethlehem Steel was distributed to the county, $575,000; the city of Bethlehem, $970,000; the Bethlehem area school district, $1.65 million; and the Saucon Valley school district, $280,000. A decision on the reassessment was expected in 1986. In other activity, Bethlehem Steel sold its Grace Mine as part of a 4,100-acre tract in Berks County to a development firm for about $3.7 million. Iron ore was produced at the mine for use in the company's steelmaking operations until it was closed in 1977.

Late in the year, United States Steel Corp. (USS), the Nation's leading steelmaker, signed a $3.7 billion agreement to purchase Texas Oil & Gas Corp. If the agreement is approved by shareholders, steel would account for about 33% of USS' total business.

USS' facilities in Pennsylvania had an annual production capacity of about 6.5 million tons of steel. Both the Monongahela Valley (Mon Valley) and Fairless Hills operations primarily produced sheet steel but neither was equipped with continuous casters. Continuous casting forms molten steel directly into a semifinished product elimi-

nating several steps in the traditional steelmaking process. Nationally, the percent of raw steel continuously cast increased from 39.6% in 1984 to 42.3% in 1985 and has doubled since 1980. Operations without continuous casting capability are considered less likely to survive strong competition in the international marketplace.

Ferroalloys.—Output of ferroalloys remained about the same in 1985, but the average price per ton dropped 22%. Continued weak demand from the steel industry and competition from imports combined to drop the average price of ferroalloys in Pennsylvania 75% below that of 1980.

About 240,000 short tons of potential domestic high-carbon ferromanganese (H-C FeMn) capacity was eliminated with the demolition of Bethlehem Steel Corp.'s "L" blast furnace in Johnstown. Elkem Metals Co., headquartered in Pittsburgh, completed the second year of a General Services Administration (GSA) contract to convert manganese ore to H-C FeMn. Elkem also received funding for 1986, and by the end of that year, a total of about 195,000 tons of manganese ore will be converted to about 105,000 tons of H-C FeMn. Federal funding through GSA totaled nearly $45 million for the 3 years.

Titanium.—In 1985, the ALTA Group began production of high-purity titanium primarily for use in the electronics industry at a plant in Evans City. ALTA used a molten salt bath electrolytic plating process developed by the U.S. Bureau of Mines.[10] High-purity titanium was produced in crystal, powder, or mill product form and used in electronic, prosthetic, or corrosion-resistant applications.

Zinc.—St. Joe Minerals Co., a subsidiary of Fluor Corp., operated a 100,000-short-ton-per-year-capacity zinc refinery in Monaca. Zinc concentrates were shipped from St. Joe's Balmat and Pierrepont Mines in New York. Workers went on strike in July when the labor contract expired, and the work stoppage continued at yearend. Production continued at the mines with supervisory and nonunion personnel but at a reduced rate. St. Joe also produced zinc oxide and dust.

The New Jersey Zinc Co. Inc. (NJZI), a subsidiary of Horsehead Industries Inc. (HII), produced zinc oxide at its refinery in Palmerton. NJZI processed ore from its Sterling, NJ, mine, slab zinc, and waste and scrap materials to produce both American- and French-process zinc oxide. Horsehead Resource Development Co. (HRD), a sister company of NJZI and also a subsidiary of HII, used Waelz kiln and sintering facilities at the Palmerton plant to produce crude zinc oxide from steelmaking EAF dusts. HRD processed about 54,000 tons of EAF dust, which contained about 20% or higher zinc content and planned to double that tonnage in 1986. The crude zinc oxide products, which generally contained about 55% zinc, 6% lead, and some cadmium, were further processed into marketable metal and zinc oxide.

EAF steelmaking dusts, listed as hazardous waste by the Environmental Protection Agency (EPA) mainly because of leachable lead, cadmium, and chromium, cost the steel industry as much as $200 per ton to dispose. About 450,000 tons of EAF dust, all containing zinc, were generated in the United States in 1985; about 75% of the tonnage was disposed at hazardous waste landfills. About 15% was processed to primarily recover zinc, mostly by HRD at Palmerton. By August 1988, a ban on disposing EAF dust at hazardous waste landfills was scheduled by the EPA. The HRD recovery process was being used for studies on environmentally safe disposal methods for EAF dust.

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[1]State Mineral Officer, Bureau of Mines, Pittsburgh, PA.

[2]Economic geologist, Pennsylvania Bureau of Topographic and Geologic Survey, Department of Environmental Resources, Harrisburg, PA.

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[6]Robertson, J. L. Homemade Dredge Mines Ohio River. Rock Prod., v. 88, No. 11, Nov. 1985, pp. 32-36.

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[8]Crissafulli, T. Cabot Undertakes Major Revamping. Am. Met. Mark., v. 93, No. 201, Oct. 17, 1985, pp. 1, 11.

[9]Bowman, L. Minimills Keeping Big Steel on the Run. The Pittsburgh Press (PA), Oct. 16, 1986, p. C14.

[10]Rogers, T. ALTA's Pure Titanium Used on Electronic Chips. Am. Met. Mark., v. 93, No. 141, July 24, 1985, p. 6.

Table 8.—Principal producers

Commodity and company	Address	Type of activity	County
Cement:			
Coplay Cement Co	Drawer 32 Nazareth, PA 18064	Plant and quarries.	Lehigh and Northampton.
General Portland Inc	5160 Main St. Whitehall, PA 18052	Plant	Lehigh.
Hercules Cement Co	Center St. Stockertown, PA 18083	Plant and quarry.	Northampton.
Lone Star Industries Inc	Wood & Prospect St. Box 270 Nazareth, PA 18064	Plant	Northampton.
Clays and shale:			
Glen-Gery Corp	Box 1542 Reading, PA 19603	Pits and plant	Adams, Berks, York.
Hanley Brick Inc	Box 376 Bradford, PA 16701	Pit	Jefferson.
McAvoy Vitrified Brick Co	Phoenixville, PA 19460	Pit	Chester.
Medusa Corp	Box 5668 Cleveland, OH 44101	Pit	Lawrence.
W. R. Turner Clay Co	Box 104, R.D. 3 Philipsburg, PA 16866	Pit	Clearfield.
Watsontown Brick Co	Box 68 Watsontown, PA 17777	Pit	Northumberland.
Lime:			
Bethlehem Steel Corp.[1]	Martin Tower Bethlehem, PA 18016	Plants and quarries.	Adams and Lebanon.
Mercer Lime & Stone Co	525 William Penn Pl. Pittsburgh, PA 15219	Plant	Butler.
Warner Co	Yellow Springs Rd. Devault, PA 19432	Plant, mine, quarries.	Centre and Chester.
Peat:			
Gouldsboro Wayne Peat Co	Box 68 Gouldsboro, PA 18424	Bog	Lackawanna.
Lake Benton Peat Moss	622 South Blakely St. Dunmore, PA 18512	Bog	Do.
Sand and gravel:			
Construction:			
Davison Sand & Gravel Co	3d Ave. and 4th St. New Kensington, PA 15068	Dredge and pits.	Armstrong and Westmoreland.
Dravo Corp	4800 Grand Ave. Pittsburgh, PA 15222	Dredge, pit, plant.	Allegheny and Beaver.
Glacial Sand & Gravel Co	Box 1022 Kittanning, PA 16201	do	Armstrong.
Stabler Co. Inc.[1]	Box 3188 Wescoville, PA 18106	Pits and plants.	Bradford and Northampton.
Warner Co	699 Bristol Pike Morrisville, PA 19067	Pit and plant	Bucks.
Industrial:			
McCrady Inc	Box 11566 Pittsburgh, PA 15238	Quarries and plant.	Allegheny.
United States Borax & Chemical Corp	Box 187 Berkeley Springs, WV 25411	do	Huntingdon.
Stone:			
Crushed:			
The General Crushed Stone Co., a subsidiary of Koppers Co. Inc.	Box 231 Easton, PA 18042	do	Berks, Bucks, Chester, Clinton, Columbia, Dauphin, Delaware, Lancaster, Montour, Tioga, York.
New Enterprise Stone & Lime Co. Inc.	R.D. 3 New Enterprise, PA 16664	do	Adams, Bedford, Blair, Cumberland, Franklin, Huntingdon, Lancaster, Somerset.
Dimension:			
A. Dally & Sons Inc	Railroad Ave., Box 27 Pen Argyl, PA 18072	Quarries and mills.	Northampton.
Delaware Quarries	Route 22 Lumberville, PA 18933	Quarry	Bucks.
Pennsylvania Granite Corp	Box 510 St. Peters, PA 19470	do	Chester.

[1]Also stone.